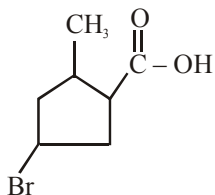




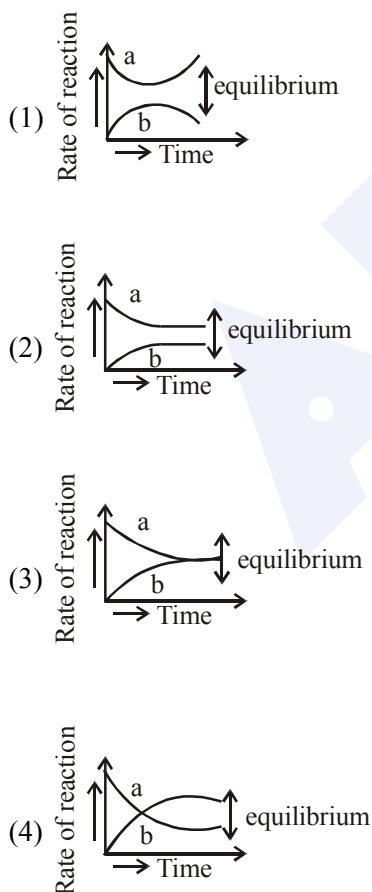
6. The IUPAC name of the following compound is :



- (1) 4-Bromo-2-methylcyclopentane carboxylic acid  
 (2) 5-Bromo-3-methylcyclopentanoic acid  
 (3) 3-Bromo-5-methylcyclopentane carboxylic acid  
 (4) 3-Bromo-5-methylcyclopentanoic acid

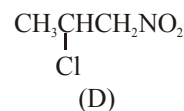
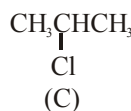
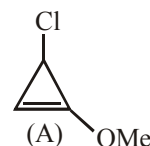
**Official Ans. by NTA (1)**

7. For the equilibrium  $A \rightleftharpoons B$ , the variation of the rate of the forward (a) and reverse (b) reaction with time is given by



**Official Ans. by NTA (3)**

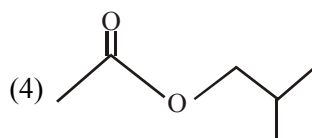
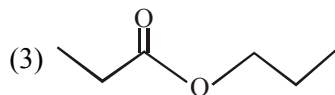
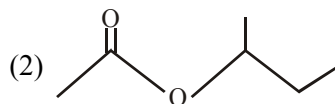
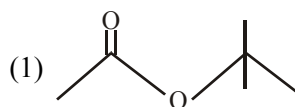
8. The decreasing order of reactivity of the following organic molecules towards  $AgNO_3$  solution is :



- (1) (A) > (B) > (D) > (C)  
 (2) (A) > (B) > (C) > (D)  
 (3) (C) > (D) > (A) > (B)  
 (4) (B) > (A) > (C) > (D)

**Official Ans. by NTA (4)**

9. An organic compound (A) (molecular formula  $C_6H_{12}O_2$ ) was hydrolysed with dil.  $H_2SO_4$  to give a carboxylic acid (B) and an alcohol (C). 'C' give white turbidity immediately when treated with anhydrous  $ZnCl_2$  and conc.  $HCl$ . The organic compound (A) is :



**Official Ans. by NTA (1)**

10. Match the following :

- |               |                |
|---------------|----------------|
| (i) Foam      | (a) smoke      |
| (ii) Gel      | (b) cell fluid |
| (iii) Aerosol | (c) jellies    |
| (iv) Emulsion | (d) rubber     |
|               | (e) froth      |
|               | (f) milk       |

- (1) (i)-(b), (ii)-(c), (iii)-(e), (iv)-(d)  
 (2) (i)-(d), (ii)-(b), (iii)-(e), (iv)-(f)  
 (3) (i)-(e), (ii)-(c), (iii)-(a), (iv)-(f)  
 (4) (i)-(d), (ii)-(b), (iii)-(a), (iv)-(e)

Official Ans. by NTA (3)

11. The elements with atomic numbers 101 and 104 belong to, respectively :

- (1) Group 11 and Group 4  
 (2) Actinoids and Group 4  
 (3) Actinoids and Group 6  
 (4) Group 6 and Actinoids

Official Ans. by NTA (2)

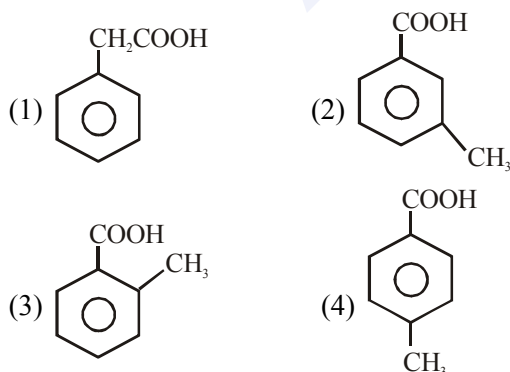
12. On combustion Li, Na and K in excess of air, the major oxides formed, respectively, are :

- (1)  $\text{Li}_2\text{O}$ ,  $\text{Na}_2\text{O}$  and  $\text{K}_2\text{O}_2$   
 (2)  $\text{Li}_2\text{O}$ ,  $\text{Na}_2\text{O}_2$  and  $\text{K}_2\text{O}$   
 (3)  $\text{Li}_2\text{O}$ ,  $\text{Na}_2\text{O}_2$  and  $\text{KO}_2$   
 (4)  $\text{Li}_2\text{O}_2$ ,  $\text{Na}_2\text{O}_2$  and  $\text{K}_2\text{O}_2$

Official Ans. by NTA (3)

13. [P] on treatment with  $\text{Br}_2/\text{FeBr}_3$  in  $\text{CCl}_4$  produced a single isomer  $\text{C}_8\text{H}_7\text{O}_2\text{Br}$  while heating [P] with sodalime gave toluene.

The compound [P] is :



Official Ans. by NTA (4)

14. The number of isomers possible for  $[\text{Pt}(\text{en})(\text{NO}_2)_2]$  is :

- (1) 3 (2) 2  
 (3) 1 (4) 4

Official Ans. by NTA (1)

15. The ionic radii of  $\text{O}_2^-$ ,  $\text{F}^-$ ,  $\text{Na}^+$  and  $\text{Mg}^{2+}$  are in the order :

- (1)  $\text{F}^- > \text{O}_2^- > \text{Na}^+ > \text{Mg}^{2+}$   
 (2)  $\text{Mg}^{2+} > \text{Na}^+ > \text{F}^- > \text{O}_2^-$   
 (3)  $\text{O}_2^- > \text{F}^- > \text{Mg}^{2+} > \text{Na}^+$   
 (4)  $\text{O}_2^- > \text{F}^- > \text{Na}^+ > \text{Mg}^{2+}$

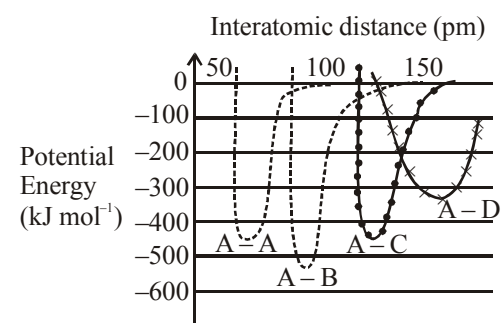
Official Ans. by NTA (4)

16. The region in the electromagnetic spectrum where the Balmer series lines appear is

- (1) Visible  
 (2) Microwave  
 (3) Ultraviolet  
 (4) Infrared

Official Ans. by NTA (1)

17. The intermolecular potential energy for the molecules A, B, C and D given below suggests that :



- (1) D is more electronegative than other atoms  
 (2) A-D has the shortest bond length  
 (3) A-B has the stiffest bond  
 (4) A-A has the largest bond enthalpy

Official Ans. by NTA (3)

18. What are the functional groups present in the structure of maltose ?

- (1) One ketal and one hemiketal
- (2) One acetal and one hemiacetal
- (3) Two acetals
- (4) One acetal and one ketal

**Official Ans. by NTA (2)**

19. For one mole of an ideal gas, which of these statements must be true ?

- (a) U and H each depends only on temperature
- (b) Compressibility factor z is not equal to 1
- (c)  $C_{p,m} - C_{v,m} = R$
- (d)  $dU = C_v dT$  for any process

(1) (a), (c) and (d)      (2) (b), (c) and (d)

(3) (c) and (d)      (4) (a) and (c)

**Official Ans. by NTA (1)**

20. The pair in which both the species have the same magnetic moment (spin only) is :

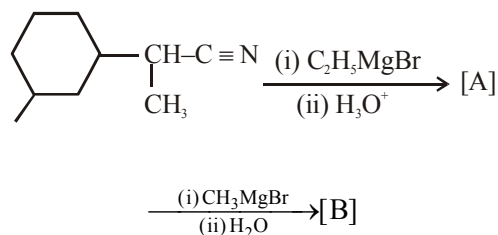
- (1)  $[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$  and  $[\text{Cr}(\text{H}_2\text{O})]^{2+}$
- (2)  $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$  and  $[\text{CoCl}_4]^{2-}$
- (3)  $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$  and  $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$
- (4)  $[\text{Co}(\text{OH})_4]^{2-}$  and  $[\text{Fe}(\text{NH}_3)_6]^{2+}$

**Official Ans. by NTA (3)**

21. The mass of ammonia in grams produced when 2.8 kg of dinitrogen quantitatively reacts with 1 kg of dihydrogen is \_\_\_\_\_.

**Official Ans. by NTA (3400)**

22. The number of chiral centres present in [B] is \_\_\_\_\_.



**Official Ans. by NTA (4)**

23. A 20.0 mL solution containing 0.2 g impure  $\text{H}_2\text{O}_2$  reacts completely with 0.316 g of  $\text{KMnO}_4$  in acid solution. The purity of  $\text{H}_2\text{O}_2$  (in %) is \_\_\_\_\_ (mol. wt. of  $\text{H}_2\text{O}_2 = 34$ ; mol. wt. of  $\text{KMnO}_4 = 158$ )

**Official Ans. by NTA (85)**

24. If 75% of a first order reaction was completed in 90 minutes, 60% of the same reaction would be completed in approximately (in minutes) \_\_\_\_\_.

(Take :  $\log 2 = 0.30$ ;  $\log 2.5 = 0.40$ )

**Official Ans. by NTA (60)**

25. At 300 K, the vapour pressure of a solution containing 1 mole of n-hexane and 3 moles of n-heptane is 550 mm of Hg. At the same temperature, if one more mole of n-heptane is added to this solution, the vapour pressure of the solution increases by 10 mm of Hg. What is the vapour pressure in mm Hg of n-heptane in its pure state \_\_\_\_\_ ?

**Official Ans. by NTA (600)**